

## **REMARKS**

Claims 1 and 3-6 are pending in the application. Claim 1 has been amended and claim 7 has been canceled.

The Examiner rejected claim 7 under 35 U.S.C. §112. Applicant has canceled claim 7 rendering the rejection moot.

It should be emphasized again that the essence of the technical solution of claim 1 lies in: (a) the inner wall of a non-stick cooking utensil is made to have a non-smooth surface with convex units having a specific shape, dimension and distribution design; and (b) an oxidized surface film is formed on the surfaces of the non-smooth convex units. As explained in detail in the specification, through the combination of the technical features (a) and (b), the following substantive and unexpected technical effects can be obtained by the invention: the effect of detaching of the non-stick cooking utensil can be improved, and the adhesive strength between food and the inner wall or bottom wall of the cooking utensil can be minimized (see page 4, lines 13-17 of the specification). Specially, on one hand, the convex units of the invention promote water repellency of the cooking utensil surface and reduce contact area between the cooking utensil surface and stick-wet foods, and the sticking intensity and stickiness between the cooking utensil and food can also be reduced. On the other hand, the oxidized surface film, which is not harmful to the environment and human body, will further reduce the sticking intensity and stickiness between the food and the surface of the cooking utensil and prevent direct contact between some metal elements and food inside the cooking utensil, and also prevent reaction between metal elements and acid alkali in the foods under high temperature. In addition, a non-stick cooking utensil of the present invention has better detaching capability and eroding resistance than can currently be provided (see page 2, line 27 to page 5, line 11 of the specification). In other words, by the combination of a non-smooth surface with convex units having specific shape, dimension and distribution design and an oxidized surface film, an optimum anti-stick effect with high detaching capability and eroding resistance can be obtained. Thus, it is the combination of the non-smooth surface and the oxidized coating that produces superior properties.

The Examiner rejected claims 1 and 4 under 35 U.S.C. §103(a) as being unpatentable over Kroyer (U.S. Patent No. 2,618,258) in view of Nagaoka (U.S. Patent No. 5,447,803).

Claim 1 has been amended to further define what is meant by a "spherical crown shape." Specifically, Figs. 2, 6, and 8 clearly illustrate a "spherical crown shape" as including a cylindrical portion that is crowned or covered by a spherical and more preferably a

hemispherical portion. Thus, a simple hemisphere is not and does not teach or suggest a spherical crown shape as that term is defined in the specification.

Kroyer teaches a cooking surface comprised of rounded depressions in combination with tops such that the cross sectional shape of the surface has a wavy form, which provides for the depressions and tops being formed continuously across the cooking utensil surface. *See Fig. 1-6, 8, col. 2, ln. 1-14 and 39-40, and col. 3 ln. 8-10.* The wavy form surface as required by Kroyer provides tops that flow directly and continuously into depressions and vice-versa, which forms the cooking utensil surface. There is no teaching or suggestion of convex units that have a cylindrical portion topped by a spherical portion. Such a shape would include nearly vertical walls and not the flowing or wavy walls clearly taught by Kroyer.

Furthermore, Kroyer does not teach or suggest convex units that include a diameter between 20 $\mu$ m to 999 $\mu$ m and a height of between 20 $\mu$ m to 999 $\mu$ m. The Examiner argues that Applicant's language would allow some deviation from a perfect hemisphere and then proceeds to try to apply the teachings of Kroyer to a perfect hemisphere. Kroyer clearly discloses that the wavy surface includes depressions that are about 1/25 of an inch or less in height and are about 1/8 to 3/8 of an inch in diameter. Thus, Kroyer does not disclose hemispherical convex units but rather discloses short, wide convex units. There is nothing in Kroyer that teaches or suggests modifying the shape to be hemispherical. Thus, while Kroyer does disclose that the depth could be less than 1/25 of an inch, there is no teaching or suggestion that the width could be less than the disclosed range of 1/8 to 3/8 of an inch. One might modify Kroyer to have shallower depths but there is no teaching or suggestion that would lead to also narrowing the width of the convex units.

In addition, Kroyer does not teach or suggest an oxidized surface film formed on the surfaces of the non-smooth convex units.

Nagaoka does not cure the deficiencies of Kroyer. Nagaoka teaches a titanium oxide film, but it is formed over the surface of a titanium nitride film, rather on the surfaces of non-smooth convex units. In addition, the function of the titanium oxide film is to produce good decorative properties, which is completely different from the function of the invention. Thus, Nagaoka teaches nothing more than that it is possible to apply a titanium nitride film to a component. However, an inventor looking to improve the non-stick properties of a pan would not be taught by Nagaoka to apply an oxide coating to the pan.

In light of the foregoing, Kroyer and Nagaoka, alone or in combination do not teach or suggest each and every limitation of claim 1. As such, claim 1 is allowable. Claims 3-6 depend from claim 1 and are also allowable over Kroyer and Nagaoka.

The Examiner rejected claims 1 and 4 under 35 U.S.C. §103(a) as being unpatentable over Kroyer in view of Grycan (U.S. Patent No. 5,921,173), McFadden (U.S. Patent No. 3,473,952), and Nagaoka.

As discussed above, Kroyer and Nagaoka do not teach or suggest each and every limitation of claim 1.

Grycan does not cure the deficiencies of Kroyer and Nagaoka. Grycan discloses protrusions 138 that are partially spherical in shape. However, the protrusions 138 do not include a cylindrical portion that is topped by a spherical portion and therefore are not spherically crown shaped as that term is defined in claim 1. In addition, Grycan provides no information regarding the size or distribution of the protrusions 138 much less the specific ranges recited in claim 1.

McFadden does not cure the deficiencies of Kroyer, Nagaoka, and Grycan. McFadden discloses a polymer release coating having a first layer of suspended glass beads. The Examiner argues it would be obvious to modify the glass beads to be hemispherical. While Applicant believes the Examiner is using impermissible hindsight to arrive at this conclusion, even if one did make this modification, one would not arrive at the present invention. A hemispherically shaped glass bead does not include a cylindrical portion that is topped by a spherical portion and thus, is not a spherical crown shape as recited in claim 1.

In light of the foregoing, Kroyer, Nagaoka, Grycan, and McFadden alone or in combination do not teach or suggest each and every limitation of claim 1. As such, claim 1 is allowable. Claims 3-6 depend from claim 1 and are also allowable.

### **CONCLUSION**

In light of the foregoing, Applicants respectfully request withdrawal of the claim objections and rejections, and allowance of the claims. Should any questions remain, the Examiner is encouraged to contact the undersigned at the number below.

Respectfully submitted,

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